

Rejection of Claims 1-3, 6, 8, 9, and 12

Independent claim 1 has been rejected as anticipated by Michaelis. To the contrary, Michaelis fails to disclose all of the limitations of claim 1. To illustrate, claim 1 recites a "*conduit means for conveying fluid to and from said fluid chamber.*" No such conduit means is found within Michaelis.

The official action points specifically to Fig. 9 of Michaelis as disclosing this claimed feature. However, *Fig. 9 of Michaelis does not show or suggest any means for conveying fluid both to and from a fluid chamber.* Instead, Figs. 9a and 9b show only fluid chambers or channels 613 and nozzles 618. The nozzles 618 **only eject fluid from** the chambers 613. Michaelis does not disclose or suggest that the nozzles 618 do anything other than eject fluid from the chambers 613.

Similarly, Fig. 1(a) of Michaelis et al. shows only that fluid from a reservoir is conveyed to a fluid chamber or channel 24 by a fluid supply tube 42. This figure does not show fluid being conveyed via this tube 42 away from the fluid chamber 24. See the written description of Michaelis at page 5, col. 8, lines 8-17 for a clear explanation. The channel 24 also has a nozzle 40 for ejecting fluid from the chamber or channel 24. No disclosure is found anywhere within either the written description or the drawings of Michaelis of a single conduit means for conveying fluid to and from said fluid chamber, as recited in claim 1.

Claim 1 further recites "*said drive circuit means being in substantial thermal contact with said conduit means so as to transfer a substantial part of the heat generated in said drive circuit to said droplet fluid.*" The official action points to a number of excerpts within the reference as disclosing this limitation, including col. 10, lines 1-17; col. 13, line 45 through col. 14, line 12; Fig. 9; and the applicant's disclosure at page 6, lines 5-9 and page 8, lines 28-31. None of these excerpts disclose or suggest such a construction.

To illustrate, Michaelis, at col. 10, lines 1-17, describes the construction of the shear mode actuators, not a drive circuit for actuating the actuators. This same excerpt also fails to disclose any relative placement of or contact between a drive circuit and a conduit. Similarly, col. 13, line 45 through col. 14, line 12 of Michaelis describes passivation and stiffness of the actuators, and describes the voltage pulses to be applied to the electrodes of the actuators. No drive circuit or placement of a drive circuit for supplying these pulses are described. Even if the electrodes that are disposed on the actuators in Michaelis were considered to constitute the recited "drive circuit means" (which they clearly are not), these are not in "substantial

thermal contact" with a fluid conduit. Neither the fluid supply pipe 42 nor the nozzles 40 are in direct contact with the electrodes or the actuators. Thus, even if incorrectly equated to the "drive circuit means" of claim 1, the electrodes or the actuators are not disclosed in Michaelis as transferring any heat generated thereby to the fluid conveyed. Michaelis is completely silent as to heat generated by a drive circuit means, much less by the electrodes and actuators. Further, even a cursory review of Fig. 9 in Michaelis and of the two excerpts within the applicant's disclosure noted in the official action reveals that these are also completely silent as to any *drive circuit means in thermal contact with a fluid conduit*.

Michaelis fails to disclose or suggest at least these limitations of claim 1. Independent claim 1 and corresponding dependent claims 2 and 3 are neither anticipated nor rendered obvious by Michaelis.

Independent claim 6 has been rejected as anticipated by Michaelis. To the contrary, Michaelis fails to disclose all of the limitations of claim 6. To illustrate, claim 6 recites "*said support member comprising at least one droplet fluid passageway communicating with said plurality of fluid chambers . . .*" The official action has characterized the nozzle plate 617 of Michaelis as the recited "support member." However, the nozzle plate 617 *does not have any fluid passageway communicating with a plurality of fluid chambers*. Instead, the plate has a plurality of conventional nozzles 618, wherein each nozzle communicates with only one chamber or channel 613. No nozzle 618 of the plate 617 communicates with more than one chamber or channel 613.

Claim 6 further recites that the support member is "*arranged so as to convey droplet fluid to or from said fluid chambers in a direction substantially parallel to said nozzle row . . .*" The nozzles 618 convey fluid only from the chambers 613, and only in a direction that is parallel to a longitudinal axis of its respective chamber or channel. This fluid conveyance direction from a given nozzle is *perpendicular to the row of nozzles*. This is the antithesis of the direction (substantially parallel to said nozzle row) as recited in claim 6.

Claim 6 further recites that the support member is arranged "*to transfer a substantial part of the heat generated during droplet ejection to said conveyed droplet fluid*." There is absolutely no disclosure within Michaelis that the nozzle plate 617 transfers heat generated during droplet ejection to the ejected droplets.

Michaelis fails to disclose or suggest at least these limitations of claim 6. Independent claim 6 and corresponding dependent claims 8, 9, and 12 are neither anticipated nor rendered obvious by Michaelis.

Rejection of Claims 13 and 15-17

Independent claim 13 has been rejected as anticipated by Aoki. To the contrary, Aoki fails to disclose all of the limitations of claim 13. To illustrate, claim 13 recites a fluid chamber having "*a port for the inlet of droplet fluid thereto*" and further recites "*a support member for said fluid chamber and including a passageway for supply of droplet fluid to said port.*" Thus, the recited port in claim 13 is an *inlet port to the fluid chamber*, and the recited passageway of the support member *supplies droplet fluid* to the inlet port.

The official action characterizes the nozzle plate 4 with nozzles 40 of Aoki to the recited support member of claim 13. Similar to the nozzles and plate of Michaelis discussed above, the nozzle plate 4 and nozzles 40 of Aoki only eject fluid away from the fluid chambers or channels 3, one nozzle for each channel. The nozzles 40 of Aoki *do not supply fluid to any inlet port of a fluid chamber 3*. The nozzle plate thus contains no passageway for the supply of fluid to any inlet port of the fluid chamber, as recited in claim 13.

Aoki fails to disclose or suggest at least these limitations of claim 13. Independent claim 13 and corresponding claims 15-17 are neither anticipated nor rendered obvious by Aoki.

Rejection of Claims 4, 5, and 7

Dependent claims 4, 5, and 7 have been rejected as obvious over Michaelis and Allen. The combination of Michaelis and Allen does not disclose or suggest all of the limitations of independent claims 1 or 6, from which these claims depend. The missing limitations of claims 1 and 6 with respect to Michaelis are discussed above. Allen fails to disclose or suggest these same limitations.

From claim 1, Allen also does not disclose or suggest: a) conduit means for conveying fluid to and from said fluid chamber; and, b) said drive circuit means being in substantial thermal contact with said conduit means so as to transfer a substantial part of the heat generated in said drive circuit to said droplet fluid.

From claim 6, Allen also does not disclose or suggest: a) said support member comprising at least one droplet fluid passageway communicating with said plurality of fluid chambers; b) the support member arranged so as to convey droplet fluid to or from said fluid chambers in a direction substantially parallel to said nozzle row; and, c) the support member arranged to transfer a substantial part of the heat generated during droplet ejection to said conveyed droplet fluid.

The combination of Allen and Michaelis, therefore, fails to disclose or suggest all of the limitations of independent claims 1 and 6 and, thus, dependent claims 4, 5, and 7.

Rejection of Claims 10 and 11

Dependent claims 10 and 11 have been rejected as obvious over Michaelis and Aoki. The combination of Aoki and Michaelis does not teach or suggest all of the limitations of independent claim 6, from which these claims depend. The deficiencies in Michaelis with respect to claim 6 are discussed above. Aoki also fails to disclose or suggest at least the same missing limitations including: a) said support member comprising at least one droplet fluid passageway communicating with said plurality of fluid chambers; b) the support member arranged so as to convey droplet fluid to or from said fluid chambers in a direction substantially parallel to said nozzle row; and, c) the support member arranged to transfer a substantial part of the heat generated during droplet ejection to said conveyed droplet fluid.

The combination of Aoki and Michaelis, therefore, fails to disclose or suggest all of the limitations of independent claim 6 and, thus, dependent claims 10 and 11.

Rejection of Claim 14

Dependent claim 14 has been rejected as obvious over Aoki and Silverbrook. The combination of Aoki and Silverbrook does not teach or suggest all of the limitations of independent claim 13, from which this claim depends. The deficiencies in Aoki with respect to claim 13 are discussed above. Silverbrook also fails to disclose or suggest the same limitations including a fluid chamber with a port for the inlet of droplet fluid thereto, and a support member for said fluid chamber that includes *a passageway in the support member for supply of droplet fluid to said port.*

The combination of Aoki and Silverbrook, therefore, fails to disclose or suggest all of the limitations of independent claim 13 and, thus, dependent claim 14.

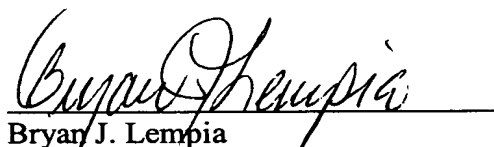
CONCLUSION

The rejections of claims 1-17 are traversed in view of the forgoing remarks. Claims 1-17 are in condition for allowance in view of the foregoing remarks. Reconsideration and withdrawal of the claim rejections are hereby respectfully solicited.

The examiner is invited to contact the undersigned at the telephone number listed below in order to discuss any remaining issues or matters of form that will move this case toward allowance.

Respectfully submitted,

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